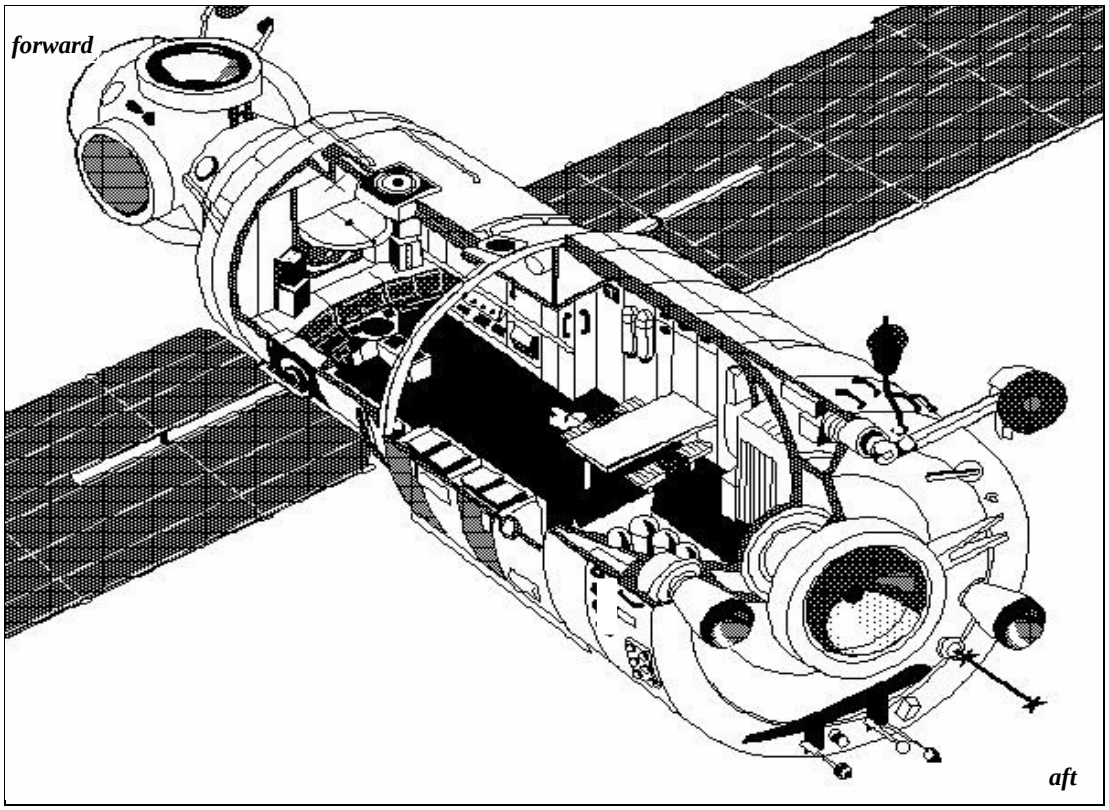
NASA Facts
National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center

International Space Station June 1997

# The Service Module:
## *A Cornerstone of Russian International Space Station Modules*

The Service Module will be the first fully Russian contribution to the International Space Station and will serve as the early cornerstone for the first human habitation of the station. It is scheduled to be launched unpiloted in December 1998 as the third station component to reach orbit, docking by remote control with the already orbiting Functional Cargo Block and Node 1 at an altitude of about 220 miles.

The 42,000-pound module, similiar in layout to the core module of Russia's Mir Space Station, will provide the early station living quarters; life support system; electrical power distribution; data processing system; flight control system; and propulsion system. It also will provide a communications system that includes remote command capabilities from ground flight controllers.




***The Service Module is derived from and similiar in design to the Mir Space Station Core Module.***

Although many of these systems will be supplemented or replaced by later U.S. station components, the Service Module will always remain the structural and functional center of the Russian segment of the International Space Station.

The module will have a wingspan of 97.5 feet from tip to tip of the solar arrays, and it will be 43 feet long from end to end. The Service Module contains three pressurized compartments: a small, spherical Transfer Compartment at the forward end; the long, cylindrical main Work Compartment; and the small, cylindrical Transfer Chamber at the aft end. An unpressurized Assembly Compartment is wrapped around the exterior of the Transfer Chamber at the aft of the module. The Assembly Compartment holds external equipment such as propellant tanks, thrusters and communications antennas.

The Service Module will include four docking ports, one in the aft Transfer Chamber and three in the spherical forward Transfer Compartment -- one facing forward, one facing up and one facing down. The aft docking port has a probe and cone docking mechanism to allow dockings by Progress resupply spacecraft and Soyuz piloted spacecraft. It also will be outfitted with an automated rendezvous and docking system. The forward docking ports all will have a hybrid docking mechanism to allow docking with the FGB using the forward-facing port; with a Russian Science Power Platform to be delivered in July 2000 using the up-facing port; and with a Russian Universal Docking Module to be delivered in December 2000 using the down-facing port.

Living accomodations on the Service Module include personal sleeping quarters for the crew; a toilet and hygiene facilities; a galley with a refrigerator/freezer; and a table for securing meals while eating. The module will have a total of 14 windows, including three 9-inch diameter windows in the forward Transfer Compartment for viewing docking activities; one large 16-inch diameter window in the Working Compartment; an individual window in each crew compartment;  and additional windows positioned for Earth and intramodule observations. Exercise equipment will include a NASA-provided treadmill and a stationary bicycle. The crew's wastewater and condensation water will be recycled for use in oxygen-generating devices on the module, but it is not planned to be recycled for use as drinking water. Spacewalks using Russian Orlan-M spacesuits can be performed from the Service Module by using the Transfer Compartment as an airlock. The module also will provide data, voice and televison communications with Mission Control Centers in Moscow and in Houston.

The Service Module will be launched on a Russian Proton booster from the Baikonur Cosmodrome, Kazahkstan. For launch, many of systems will be in a standby mode. Once in orbit, preprogrammed commands onboard will fully activate its systems, the solar arrays will be deployed and the communications antenna will be deployed. The Service Module then will become the passive vehicle for the rendezvous with the already-orbiting Functional Cargo Block and Node 1 spacecraft. As the passive "target" vehicle, the Service Module will maintain a stationkeeping orbit as the FGB/Node 1 vehicle performs the rendezvous and docking via ground control and the Russian automated rendezvous and docking system.